Dell

Business Client

Re-Image "How-To" Guide

Latitude E-Family & Mobile Precision

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Contents

1 Overview

The purpose of this document is to detail the required steps for reimaging Dell Latitude E-Family & Mobile Precision notebooks.

Dell Latitude E-Family & Mobile Precision notebooks systems ship with Microsoft operating systems (see Chapter 2.1 for detail). These images include the Dell recommended software stack and settings, drivers, and applications which are tested and validated with the system.

Drivers and applications must be installed on Dell Latitude E-Family & Mobile Precision systems in a prescribed order to ensure optimal performance. Failure to install drivers and applications as detailed in this document may result in undesirable performance.

Dell provides drivers and applications that are not included in Microsoft Operating Systems. These drivers are required to enable the new technologies and features of Dell Latitude E-Family & Mobile Precision products, including the 512e Advanced Format HDD (See appendix –B). Reinstalled images should be built from a clean hand installed OS load and following the steps in this guide. Dell does not recommend starting from an image built on previous generations of products or other computer systems.

Dell recommends ensuring BIOS settings (including SATA configurations modes) are correctly set and using the latest device drivers and applications when imaging their systems.

This "How-To" guide applies to the following Latitude E-Family & Mobile Precision systems:

Product	1st Generation	2nd Generation	3rd Generation	4th Generation
Latitude E-Family	E4200	-	E6220	E6230
	E4300	E4310	E6320	E6330
	E5400	E5410	E5420/E5420m	E5430
	E5500	E5510	E5520/E5520m	E5530
	E6400	E6410	E6420	E6430/E6430s
	E6400 ATG	E6410 ATG	E6420 ATG	E6430 ATG
	E6500	E6510	E6520	E6530
Precision Mobile WorkStations	M2400	-	-	
	M4400	M4500	M4600	
	M6400	M6500	M6600	

2 "How-To"

2.1 Supported Operating Systems

The following Microsoft operating systems have been validated for use on Dell Latitude E-Family & Mobile Precision notebook computers:

> ***Note***: *Not all generation notebook computers can ship with below Microsoft operating systems. XP only available via CFI service on 3rd and 4th Generation systems*

- Microsoft Windows XP 32 Bit: Validated on 1st, 2nd, 3rd and 4th Generation systems.
- Vista 32 & 64-Bit: Validated on 1st, 2nd, and 3rd Generation systems.
- Windows 7 32 & 64-Bit: Validated on 2nd, 3rd and 4th Generation systems.

2.2 Latitude E-Family & Mobile Precision New Features & Image Impact

Dell Latitude E-Family & Mobile Precision systems feature new hardware technologies which require a new software stack, drivers, and / or applications. These products are not compatible with previous images built or installed on none Latitude E-Family, Mobile Precision or previous Dell products. Images between 1st, 2nd, 3rd & 4th generations Latitude E-Family & Mobile Precision are also not compatible

Among these new hardware and technologies are:

2.2.1 New Features Offered on Latitude E-Family & Mobile Precision systems, All Generations:

Note: *Not all features are available on all systems*

- New BIOS architecture – Latitude E-Family & Mobile Precision
- Chipset
  1. Intel Core i3, i5 & i7 Dual Core CPUs that include updated integrated graphics
  2. 1st ~3rd Generation Intel Core i3, i5, i7 CPUs that include updated integrated graphics
- eSATA/SATA3
- Intel Turbo Boost
- 512e / 4KBe Sector HDDs
- Intel AMT (Intel Active Management Technology) & vPRO
- Intel RAID Functionality – only for Mobile Precision
- Graphics controller (Intel, nVidia and AMD)
- HDMI Audio
- Network LoM (Intel and Broadcom)
- Wireless LAN
- Wireless WAN
- WiMAX
- Bluetooth
- UWB - *Latitude E-Family & Mobile Precision 1st & 2nd generation*
- Dell Control Vault
- Contactless smartcard / RFID
- Webcam
- USB 3.0
- Free Fall Sensor on the mother board
- Multi-touch Touchpad
- Dell Control Point, *1st and 2nd generation Latitude E-Family & Mobile Precision*
- Dell Feature Enhancement Package(DFEP) - *Latitude E-Family & Mobile Precision 3rd & 4th generation*
- Dell Data Protection | Access(DDPA) - *Latitude E-Family & Mobile Precision 3rd & 4th generation*

- Dell Data Protection | Encryption(DDPE) - *Latitude E-Family & Mobile Precision 3rd* & *4th generation*
- Privacy Panel
- Touch Screen Digitizer- Four Fingers touch with Stylus support on *Latitude E-Family & Mobile Precision 3rd generation. Ten fingers touch support on Mobile Precision 4th generation.*
- Latitude On / Precision On - Reader, Flash, and ARM - *Latitude E-Family & Mobile Precision 1st &2nd generation*
- WiDi display - *Latitude E-Family & Mobile Precision 4th generation*
- Intel® Responsiveness Technologies – *Latitude E-Family & Mobile Precision 4th generation*
- Dell Battery Management – *Latitude E-Family & Mobile Precision 4th generation*

2.3 Latest Drivers / Applications and Utilities

Dell recommends always obtaining the latest and most updated BIOS, drivers, firmware, and applications. Dell validated and tested drivers and applications are located on Dell's support web site http://support.dell.com/

- Enter the Service Tag or select the product model and the model number
- Select Operating System (32-Bit or 64-Bit version must be selected)
- Choose drivers and downloads

2.4 Installation Sequence

The list below is a **general overview** of drivers and applications that must be installed on Dell Latitude E-Family & Mobile Precision systems in a prescribed order to ensure optimal performance. Actual system configurations may vary.

***Note**: Dell Alienware, Inspiron, Studio, XPS and Vostro Laptops may have different installation sequence. Please refer to Dell Support Website for these Laptops.*

2.4.1 Installation Sequence Overview

Order Of Installation

Hardware

- **Hardware**: Intel Core 2 Duo & Solo & Celeron M – E-Family 1st generation; 1st~3rd Gen Intel Core i3, i5 & i7 – E-Family 2nd ~4th generation

Software

- **System BIOS**: System BIOS specific to platform
- **Firmware**:
  - Integrated Wired Network Controller
  - Touch LCD
  - WebCam Modules
- **Operating System**:
  - Windows XP 32 & 64-Bit
  - Vista 32 & 64-Bit
  - Windows 7 32 & 64-Bit
- **Device Drivers / FWs**:
  1. Intel Chipset
  2. Dell Desktop System Software
  3. PCMCIA/ Smart Card controller
  4. Intel Storage:
  5. Audio
  6. Graphics
  7. Intel Turbo Boost (only on E-Family 2nd generation systems)
  8. Integrated Wired Network Controller & Intel PROSet Utility / Application
  9. Dell Control Point Security Driver Pack
  10. Wireless Local Area Network Adapters (WLAN)
  11. Wireless Personal Area Network Adapter (UWB / WPAN)
  12. Mobile Broadband Wireless Wide Area Network Adapter (WWAN)
  13. Touch Pad/Track Stick/Pointer
  14. Free Fall Sensor
  15. Modem
  16. Intel vPro or AMT
  17. USB 3.0
  18. Touch Screen Digitizer
  19. Webcam driver – XP (32 & 64-Bit) only
  20. Control Vault Firmware
- **Applications**:
  - Dell Control Point – DCP
    - System Manager
    - Connection Manager – E-Family 1st generation only
    - Security Manager
  - Latitude On & Precision On Reader & Flash
  - Backup & Recovery Manager
  - Dell Feature Enhance Package - DFEP
  - Dell Data Protection | Access - DDPA
  - WiDi display

2.4.2 Installation Sequence & Features at a Glance:

2.4.2.1 BIOS, Drivers and Firmware:

- BIOS
- Intel Chipset - Helps Windows control system board components and controllers.
- Dell Desktop System Software - A compilation of critical Microsoft QFEs updates
- Media Memory Card / SmartCard controller - Enables and enhances the Media Memory / SmartCard controller
- Intel Storage:
  1. Intel Matrix Storage Manager – Latitude E-Family & Mobile Precision 1st generation
  2. Intel Rapid Storage Technology – Latitude E-Family & Mobile Precision 2nd, 3rd & 4th generations
- Audio - Enables and enhances the audio controller
- Graphics:
  1. Enhances and optimizes video performance
  2. Enables & provides additional functionality that are not included in MS native VGA driver
     - User customizable Power Management features
     - Portability & behavioral profiles
     - Multiple monitor support
- Intel Turbo Boost (only for E-Family 2nd generation systems. 3rd/4th generation systems do not need this driver)
  1. A driver-based power management mechanism for Intel i3, i5 and i7 processors
  2. Intelligent power sharing across cores
  3. Budgets power limits available to Processor or graphics turbo Processor
- Integrated Wired Network Controller & Intel PROSet Utility / Application - Enables and enhances the network controller
- Control Point Security Driver pack- only for E-Family 1st generation systems
  1. Installs and enables the security devices & controllers
  2. Even if you do not install the Control Point managers you should install the Control Point security driver as it contains needed drivers
- Networking & Communication
  1. Wireless Local Area Network Adapters (WLAN) - Enables and enhances the Wireless LAN network adapter
  2. Wireless Personal Area Network Adapter (UWB / WPAN) - Enables and enhances the UWB or Bluetooth Adapter
  3. Mobile Broadband Wireless Wide Area Network Adapter (WWAN) - Enables and enhances the Broadband wireless Adapter
- Touch Pad / Track Stick / Pointer - Enhances the pointing device features
- Free Fall Sensor
- Modem - Enables and enhances the modem
- Intel vPro or AMT – Enhances System Manageability

- HW based solution using out-of-band communication for management access to client systems (independent of the system state)

- USB 3.0
- Touch Screen Digitizer
- Control Vault Driver Update (FingerPrint Reader, Contactless Smart Card reader tied in DDPA package on E-Family 3rd & 4th generation systems)

2.4.2.2 Applications:

- Dell Control Point (DCP)- 1st & 2nd generations Latitude E-Family & Mobile Precision
    1. Control Point System Manager
        - DCP Extended Battery Life – EBL
            - Requires Dell DCP System Manager (*for all System Manager release*)
            - Requires Security driver (*for System Manager version 1.0 & 1.1 only*)
        - DCP – Ambient Light Sensor
            - Requires Dell DCP-SM or ALS utility in case DCP-SM is not desired and under Microsoft Windows Vista only
    2. Control Point Connection Manager
    3. Control Point Security Manager (Requires Dell Control Point security driver pack)
- Dell Feature Enhance Package (DFEP) - 2nd , 3rd & 4th generations Latitude E-Family & Mobile Precision
- Dell Data Protection | Access - 3rd & 4th generations Latitude E-Family & Mobile Precision
- Dell Data Protection | Encryption - 3rd & 4th generations Latitude E-Family & Mobile Precision
- Latitude On / Precision On – Reader, Flash, and ARM – 1st & 2nd generations Latitude E-Family & Mobile Precision
    1. Communication solution that is designed to provide quick access to business critical data
- Intel Responsiveness Technology, *4th generation Latitude E-Family & Mobile Precision*
    1. Intel® Smart Response Technology
    2. Intel® Rapid Start Technology
    3. Intel® Smart Connect Technology

2.5 BIOS

Dell recommends flashing the latest BIOS available to the system. This is posted on Dell's driver & downloads support web site (support.dell.com) under the "BIOS" section.

Some of the BIOS settings are critical to Operating System performance and installation. These are as follows:

Settings → System Configuration →SATA Operation

- Disabled: SATA Controllers are hidden
- ATA, Basic Disk Operation mode, does not require additional storage driver. ***Note***: eSATA is not functional in this mode
- AHCI, SATA bus is configured for AHCI mode (Advanced Disk Operation mode) which offers faster performance, eSATA support, and increased battery life. This mode requires an additional storage driver provided by Dell
- IRRT / RAID On, SATA bus is configured to support IRRT (Intel's Rapid Recovery Technology). This mode supports AHCI mode features as well as disk mirroring (RAID-1). IRRT allows data backup and restoration. This mode requires an additional storage driver provided by Dell
- RAID, SATA bus is configured to support RAID. This mode supports AHCI mode features as well as disk mirroring (RAID-1). RAID allows data backup and restoration. This mode requires an additional storage driver provided by Dell.

  Note:

    - *RAID support requires second hard disk drive.*

- If AHCI, IRRT, RAID On, or RAID modes are selected, Intel's Matrix Storage Manager / Intel Rapid Storage Technology driver must be installed in conjunction with the installation of the Operating System. See section "2.6.4 Intel Storage" of this document

TPM Security:

Note:

- *This setting is not available for Non-TPM configuration of 4th generations Latitude E-Family & Mobile Precision.*

These options enable and configure the Trusted Platform Module (TPM). If TPM is to be deployed, TPM must be enabled in the BIOS Setup program

2. Security → TPM Security
   - TPM Security:
     - Disabled ***(Default)***: The BIOS will not turn on the TPM during POST. The TPM will be non-functional and invisible to the Operating System
     - Enabled: The BIOS will turn the TPM during POST so that it can be used by the Operating System
   - Deactivate ***(Default)*** = The TPM will be deactivated
   - Activate = The TPM will be enabled and activated
   - Clear = The BIOS clears the information stored in the TPM

Intel Responsiveness Technology:

Please refer to *Intel Responsiveness Technologies Guide* for detail settings of these features.

2.6 Recommended Drivers / Applications Installation Order

For best results, Dell recommends installing drivers / applications in the following order:

2.6.1 Intel Mobile Chipset Software Installation Utility

- Microsoft Operating Systems might not include the updated Intel Chipset Mobile driver for Dell Latitude E-Family & Mobile Precision notebooks. The Intel Mobile Chipset driver is available on Dell's driver & downloads support web site (support.dell.com) under the "Chipset" section

2.6.2 Dell System Software for critical Microsoft QFEs

- Dell recommends installing all of the latest available fixes specific to the systems
- For 1st, *2nd, &3rd generation Latitude E-Family & Mobile Precision,* these are available through the Dell System Software utility posted on Dell's driver & downloads support web site (support.dell.com) under the "System Utilities" section
- For *4th generation Latitude E-Family & Mobile Precision,* please enable the Windows Update and connect to Internet once install the driver of Integrated Wired Network Controller. (see more detail in chapter 2.6.22)

2.6.3 Media Memory Card Controller

- Microsoft Operating Systems do not include the Memory Card controller driver. Install the following driver provided by Dell:
    - R5C8xx Ricoh driver is available on Dell's driver & downloads support web site (support.dell.com) found under the "Chipset" section
    - PCI8412 TI driver (Applies only for M6500) is available on Dell's driver & downloads support web site (support.dell.com) found under the "Chipset" section
    - O2 Micro driver (Applies for 3rd & 4th generation Latitude E-Family & Mobile Precision) is available on Dell's driver & downloads support web site (support.dell.com) found under the "Chipset" section

2.6.4 Intel Storage - Intel Matrix Storage Manager / Intel Rapid Storage Technology

- The Intel Matrix Storage Manager (IMSM) driver on Dell 1st generation Latitude E-Family & Mobile Precision or Intel Rapid Storage Technology (IRST) driver on 2nd & 3rd generations Latitude E-Family & Mobile Precision is required to be installed on Operating Systems in AHCI, IRRT, RAID On, and RAID SATA modes

- The Intel IMSM or IRST application must also be installed

- The SATA operation modes are configured in the BIOS. Refer to the BIOS section 2.5
- If the SATA mode is configured in AHCI, IRRT, RAID On, or RAID mode, the IMSM / IRST driver must be installed during the initial Operating System installation stages. The IMSM / IRST driver is only available from Dell

- If SATA configuration mode in the BIOS is set to either AHCI, IRRT, RAID On, or RAID, install the Dell IMSM / IRST driver and application available on Dell's driver & downloads support web site (support.dell.com) under the "Serial ATA" section

- Follow these steps to install the IMSM / IRST driver:

  1. **For Microsoft XP 32 & 64-Bit Operating Systems:**
     - **Installing the Intel IMSM driver using the Floppy Drive**
       - Boot to the Dell Recovery DVD (RDVD) and select the Create RAID driver from the list of items. You will need Floppy Disk Drive and a diskette for this selection. The IMSM / IRST driver must be on the root of the A:\
         Note: the latest IMSM / IRST driver can also be obtained from support.dell.com under the "SATA Drivers" section
       - Once the driver is extracted and stored on the target diskette, boot to the operating system CD and start the installation
       - In the initial stage of Windows Setup, press <F6> to install the third-party IMSM SCSI or RAID drivers
       - When prompted, insert the floppy disk containing the IMSM driver and follow the instructions provided by Windows Setup
       - After reading the floppy disk, either choose "Intel(R) ICH9M-E/M SATA AHCI Controller" if in AHCI mode or "Intel(R) ICH8M-E/ICH9M-eSATA RAID Controller" if in IRRT mode – select the appropriate driver to install

  2. **For Microsoft Vista / Windows 7 (32 & 64-Bit) Operating Systems:**
     - **Installing the Intel IMSM / IRST driver after the installation of the Operating System**
       - Boot to the Operating System DVD or Boot from PXE , then start the OS installation
       - After completing the OS installation, insert the Dell RDVD
       - Select the IMSM / IRST driver and follow the installation procedure

       Note: *the latest IMSM / IRST driver can also be obtained from support.dell.com under the "SATA Drivers" section*

- If Intel Rapid Recovery or RAID Technologies is to be used, ensure the following:
  1. SATA operation mode in the BIOS is set to the appropriate IRRT, RAID On, or RAID mode
  2. Microsoft Operating System was installed under IRRT, RAID On, or RAID mode and the latest Intel Storage IMSM / IRST driver is installed
  3. Install the following Intel IMSM application provided by Dell:
     - Intel Matrix Storage Manager Application, or
     - Intel Rapid Storage Technology Application

2.6.5 Graphics:

- Microsoft Operating Systems include the VGA graphics drivers only. Therefore for optimum graphics performance, Dell recommends installing the Dell graphics driver applicable to their system available on Dell's driver & downloads support web site (support.dell.com) under the "Video" section

  Note:
  For the nVidia Discrete Graphics solution on Latitude E-Family & Mobile Precision 3rd & 4th Generation platforms (refer to the below table), the following should be followed:
  1. *First, install the Intel Media adapter Graphics driver that applies to the system*
  2. *Second, install the nVidia Discrete Graphics driver that applies to the system*

  Note:
  Both 2nd & 3rd Generation Intel® Core™ CPUs are available on 4th generation Latitude E-Family & Mobile Precision. Please re-install the Graphics driver when exchange CPU from 2nd Generation CPU to 3rd Generation CPU and vice versa.

- Under XP 32-Bit with service packs earlier than Service pack-3 and for Latitude E-Family & Mobile Precision 1st generation only, the Audio driver must be installed prior to installing the graphics driver. This applies to Intel graphics solution only. Please refer to the section 2.6.6 Audio in this document.

- The following table lists the various graphics solutions' offerings on Dell Latitude E-Family & Mobile Precision products:

	Graphic Solution	E4200	E4300	E5400	E5500	E6400	E6400 ATG	E6500	M2400	M4400	M6400	E6410	E6410 ATG	E6510	M4500	M6500	E5420 / E5520	E6320	E6420	E6420 ATG	E6520	M4600	M6600	E5430 / E5530	E6230/E6330	E6430/E6430s	E6430 ATG	E6530
		1st Generation										2nd Generation					3rd Generation							4th Generation				
Intel	Intel GMA 4500MHD Graphics	x	x	x	x	x	x	x																				
Intel	Intel GMA HD Graphics											x	x	x	x													
Intel	Intel Media Adapter HD/HD 2000/3000/4000																x	x	x	x	x			x	x	x	x	x
nVidia	Quadro NVS 160M			x		x		x	x	x																		
nVidia	Quadro FX 2700M / 3700M										x																	
nVidia	Quadro NVS 3100M											x		x														
nVidia	Quadro FX 880M & 1800M														x													
nVidia	Quadro FX 2800M / 3800M															x												
nVidia	N12M 512MB DDR3 Switchable Discrete Graphics																		x	x	x							
nVidia	Quadro 1000M with 2GB GDDR3 w/Optimus																					x						
nVidia	Quadro 2000M with 2GB GDDR3 w/Optimus																					x						
nVidia	NVS 5200M 1GB DDR3 w/Optimus																									x	x	x

	ATI FirePro M7740	x	x		
AMD	AMD FirePro M5950 Mobility Pro Graphics with 1GB GDDR5	x	x	x	
	ATI FirePro M7740	x	x		
	Quadro 3000M with 2GB GDDR5 w/Optimus				x
	Quadro 4000M with 2GB GDDR5 w/Optimus				x
	Quadro 5000M with 4GB GDDR5 w/Optimus				x
	AMD FirePro M8900 Mobility Pro Graphics with 2GB GDDR5				x

2.6.6 Audio:

- Microsoft Operating Systems do not include the Audio driver recommended by Dell. The IDT 92HDxxx HD Audio driver is available on Dell's driver & downloads support web site (support.dell.com) under the "Audio" section

  Note: Under XP 32-Bit only with service packs earlier than Service pack-3 and for Latitude E-Family & mobile Precision 1st generation only, the Audio driver must be installed prior to installing the graphics driver. This applies to Intel graphics solution only

2.6.7 Intel Turbo Boost Driver – (*applies for 2nd generation Latitude E-Family & Mobile Precision only)*

- Intel Turbo Boost driver is required to be installed on platforms meeting both of following criteria:
  1. nVidia or ATI discrete graphics cards
  2. Core i7 and i5 Dual Core CPUs
- Microsoft Operating Systems do not include the Intel Dual-Core Turbo Boost driver. Install the following driver provided by Dell:
  - Dual-Core Turbo Boost driver is available on Dell's driver & downloads support web site (support.dell.com) found under the "CPU" section

2.6.8 Integrated Wired Network Controller (Ethernet)

- Microsoft Operating Systems XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit either do not provide native support or do not include the driver recommended by Dell. Install the following Dell driver for network connectivity

1st Generation

Solution	E4200	E4300	E5400	E5500	E6400	E6400 ATG	E6500	M2400	M4400	M6400
Intel 825xx Gigabit Platform LAN Network device	x	x			x	x	x	x	x	
Broadcom 57XX Gigabit Integrated Controller			x	x						x

2nd Generation

Solution	E4310	E5410	E5510	E6410	E6410 ATG	E6510	M4500	M6500
Intel 825xx Gigabit Platform LAN Network device				x	x	x	x	
Broadcom 57XX Gigabit Integrated Controller		x	x					x

3rd Generation

Solution	E5420 / E5520	E6320	E6420	E6420 ATG	E6520	M4600	M6600
Intel 825xx Gigabit Platform LAN Network device		x	x	x	x	x	x
Broadcom 57XX Gigabit Integrated Controller	x						

4th Generation

Solution	E5430 / E5530	E6230/E6330	E6430/E6430s	E6430 ATG	E6530
Intel 825xx Gigabit Platform LAN Network device		x	x	x	x
Broadcom 57XX Gigabit Integrated Controller	x				

- Network Controller drivers are available on Dell's driver & downloads support web site (support.dell.com) under the "Network" section

  Note: To ensure full functionality of the Intel Gigabit Network adapter, Dell recommends that you install the Intel PROSet available on Dell's driver & downloads support web site (support.dell.com) under the "Network" section

2.6.9 Dell Control Point – DCP, *(applies to 1st & 2nd generations Latitude E-Family & Mobile Precision only)*

2.6.9.1 Control Point Security Device Driver

Note: for 2nd generation Latitude E-Family & Mobile Precision, the Control Point Security Device driver needs to be applied only if the Control Point Security Manager is used, it is not required for the Dell Data Protection | Access suite.

- Microsoft Operating System does not have the desired drivers and applications necessary for the security functions offered on Latitude E-Family & Mobile Precision

- The driver will install the device driver for the security devices installed in the Dell E-Family notebook computer. In addition, it will install Microsoft Net framework 2.0 SP1 and any relevant Microsoft QFEs required allowing these security devices to operate correctly

- The driver supports the following Security devices:
  1. Broadcom Trusted Platform Module
  2. Atmel Trusted Platform Module
  3. STMicroelectronics Trusted Platform Module
  4. Winbond Trusted Platform Module
  5. O2Micro Smart Card Reader
  6. Dell Smart Card Keyboard
  7. UPEK TouchChip Fingerprint Reader
  8. Authentec Fingerprint Reader
  9. Broadcom Unified Security Hub
  10. Vista Storage driver Update (for ATAPI.SYS)

- The Control Point Security Device Driver is available on Dell's driver & downloads support web site (support.dell.com) under the "Control Point" section

2.6.9.2 Control Point System Manager

- Dell Control Point System Manager module is a Dell developed modular application providing a complete set of power management configuring and alerting capabilities:
  - Battery Status
  - Power Scheme and Sleep Mode
  - Display and Devices
  - Keyboard Backlighting and Hotkeys Customization
  - Extended Battery Life / All Day Battery Life

- The Control Point System Manager Application is available on Dell's driver & downloads support web site (support.dell.com) under "Control Point" section

- Refer to Table B1 under Appendix-B for DCP System Manager features

- For Extended Battery Life feature (EBL), install the Dell Control Point components offered by Dell in addition to the System Manager Module(version 1.2 & 1.3)
  - Control Point System Security Manager driver (*applies to Control Point System Manager 1.0 and 1.1*)
  - Control Point System Manager XML file (*applies to Control Point System Manager 1.0, 1.1, 1.2 and 1.3. Not required for 1.4 and beyond*)

- For Ambient Light Sensor (ALS), install the Dell Ambient Light Sensor Utility component of Control Point in addition to the System Manager Module. This component is applicable to Vista 32 & 64-Bit only, and is not required for XP 32 & 64-Bit and Win7 32 & 64-Bit

  Note: *Customers can obtain ALS feature by installing ALS utility in case Control Point System Manager is not desired and under Microsoft Windows Vista only*

2.6.9.3 Control Point Security Manager

- Dell Control Point Security Manager module is a Dell developed modular application providing provides access to authentication, encryption, fingerprint readers, and smartcard technologies:
  1. Obtain Security Status
  2. Manage Logins and Passwords
  3. Manage Data Protection

- Security Software Stack:

1. For these security devices to function and interface on E-Family notebooks, install the appropriate Software stack (Applications and Utilities)
2. The security software stack can be obtained through one of the two options:
3. Control Point Security Manager Application which is offered to E-Family Customers through Dell's support website
4. Third party security software specific to the customer's environment. Dell does not provide 3rd party security software

- The Control Point Security Manager Application is available on Dell's driver & downloads support web site (support.dell.com) under the "Control Point" section

- Refer to Table B2 under Appendix-B for DCP Security Manager features

2.6.9.4 Control Point Connection Manager, *(applies to 1st generation Latitude E-Family & Mobile Precision only)*

- Dell Control Point Connections Manager module is a Dell developed modular application providing a complete communications management environment:
  - Allows the user to create multiple mobile profile settings

  - Ability to create, export, and import user defined usage profiles
  - System custom configuration
  - Execute comprehensive diagnostics and troubleshooting
  - Provides the capability to enable or disable any of the radios on the notebook such as Wi-Fi, Bluetooth GPS, UWB, and mobile broadband

- The Control Point Connection Manager Application is available on Dell's driver & downloads support web site (support.dell.com) under the "Control Point" section

- Refer to Table B3 under Appendix-B for DCP Security Manager features

2.6.10 Dell Feature Enhancement Pack – DFEP, *(applies to Latitude Precision 3rd & 4th generation E-Family & Mobile)*

- Dell Feature Enhancement Pack – DFEP is a Dell developed application providing a complete set of power management configuring and alerting capabilities
  - Support for hot keys and system events
  - Dell customized power plans and extensions
  - Battery Health Information
  - Touch Panel
  - Keyboard hotkey information, including backlighting
  - Smart Settings

- The DFEP Application is available on Dell's driver & downloads support web site (support.dell.com) under "System Utilities" section

  Note: Supported for Windows7 only

  Note: Dell Feature Enhancement Pack will uninstall Dell System Manager if present on the systems

2.6.11 Dell Data Protection | Access – DDPA, *(applies to Latitude Precision 3rd & 4th generations E-Family & Mobile only)*

- Dell Data Protection Access Application is a Dell developed application providing provides access to authentication, encryption, fingerprint readers, and smartcard technologies:
  - Obtain Security Status
  - Manage Logins and Passwords
  - Manage Data Protection

- The Dell Date Protection | Access Application components are available on Dell's driver & downloads support web site (support.dell.com) under the "Dell Data Protection" section

- The following components should be installed in order:

  - Prerequisites Installer
    - This installer contains Windows Installer 4.5 and Microsoft .NET Framework 3.5 SP1
    - Both of these are required in order for Dell Data Protection | Access to work on Windows XP and Vista

  - Drivers Installer

    Note: The Dell Data Protection | Access application installer will not install if the DDPA Drivers installer is not on the platform FIRST

    Note: Application Installer for 4th generations Latitude E-Family & Precision Mobile INCLUDED driver and middleware Installer already. Please ignore Drivers and Middleware Installer on 4th generations Latitude E-Family & Precision Mobile.

  - Middleware Installer
    - This installer contains certain relevant Microsoft QFEs
    - It also contains the NTRU Trusted Software Stack (TSS) that provides TPM access

  - Application Installer
    - This is the main application Dell Data Protection | Access

    Note: It will only install if the Drivers Installer has already been installed on the system, so the installation order is important

- Refer to Table B3 under Appendix-B for DDPA – Data Protection Access

2.6.12 Wireless Local Network Adapters (WLAN)

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit and Win7 32 & 64-Bit Operating Systems do not provide native device driver support for WLAN controllers featured in Dell Latitude E-Family & Mobile Precision systems. To obtain wireless network functionality, install the Wireless LAN device driver applicable to the WLAN devices installed in the notebook computer found under the "Network" section posted on Dell's driver & downloads support web site (support.dell.com). The installer also provides WLAN application support which provides additional features including enterprise authentication enhancements

    Note: With Intel Wireless Display (WiDi) you can quickly connect your laptop to your TV and projector using the Intel® Centrino®wireless solution that's already built into your laptop. Because it's based on Wi-Fi*, there are no cables between the laptop and TV/Projector. To obtain Wireless Display(ONLY applied to Intel WLAN) functionality, install the Wireless Display Application found under the "Network" section posted on Dell's driver & downloads support web site (support.dell.com).

- Microsoft Windows XP 32 & 64-Bit, Windows Vista 32 & 64-Bit, and Windows 7 32 & 64-Bit Operating Systems do not provide native device driver support for WiMAX controllers featured in Dell E-Family systems. To obtain WiMAX functionality, install the WiMAX software applicable to the WiMAX device installed in the notebook computer. This is available on Dell's driver & downloads support web site (support.dell.com) under the "Network" section

- Customers choosing to utilize the Dell Wireless (DW) WLAN Card Utility or Intel PROSet / Wireless should not install Control Point Connection Manager. If Control Point Connection Manager is installed, uninstall the existing Intel PROSet / Wireless or Dell Wireless WLAN entries in Add / Remove Programs (or Programs and Features) before installing this software. Customers may also choose to uninstall Dell Control Point Connection manager or uncheck the Wi-Fi control within Dell Control Point Connection Manager

2.6.13 Wireless Personal Area Network Adapter (UWB / WPAN)

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not support the Bluetooth controllers featured on Latitude E-Family & Mobile Precision systems. To obtain Bluetooth or UWB functionality, install the associated Bluetooth or UWB device drivers available on Dell's driver & downloads support web site (support.dell.com) under the "Network" section

2.6.14 Mobile Broadband Wireless Wide Area Network Adapter (WWAN)

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not provide native support for the broadband Wireless WAN controllers featured in Dell Latitude E-Family & Mobile Precision systems. To obtain broadband functionality, install the Broadband device driver applicable to the wireless WAN devices installed in the system, and to the service carrier you have a contract with available on Dell's driver & downloads support web site (support.dell.com) under the "Communication" section

- The Wireless 5600 EVDO-HSPA module(***applies to 1st generation Latitude E-Family & Mobile Precision only***) requires the installation of Dell Control Point Connection Manager. Install the driver and FW before installing the Dell Control Point Connection Manager. The latest versions of Dell Control Point Connection Manager (v1.3 and later) provide the WWAN drivers and FW in the Dell Control Point Connection Manager Driver Pack. Earlier versions provide the drivers and FW in one single Dell Control Point Connection Manager installer. The Dell Control Point Connection Manger application and Driver Packs can be found under the "Control Point" section posted on Dell's driver & downloads support web site (support.dell.com). Individual driver and FW releases for the 5600 EVDO-HPSA module can be found under the "Communication" section posted on Dell's driver & downloads support web site (support.dell.com). It is highly recommended to use the Driver Packs to ensure version compatibility

2.6.15 Touchpad

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the Dell Touchpad drivers

- The Microsoft native OS mouse driver only provides basic point and click functionality. No advanced features are available with the native driver and this may provide a less than optimal user experience

- Dell recommends installing the appropriate Dell Touchpad driver for the following user experience benefits:
  1. The driver is tuned to the system characteristics to offer enhanced cursor acceleration and precision
  2. The driver provides the core palm rejection features
  3. Access to additional features and control setting (varies with system) including:
     - Enhanced scrolling and tapping
     - Touch sensitivity control
     - Multi-Touch Gestures (2nd Generation)
     - Jog Shuttle control (M6400 & M6500)

Differences between Dell Touchpad devices and drivers:

Solution	1st Generation										2nd Generation								3rd Generation							4th Generation				
	E4200	E4300	E5400	E5500	E6400	E6400 ATG	E6500	M2400	M4400	M6400	E4310	E5410	E5510	E6410	E6410 ATG	E6510	M4500	M6500	E5420 / E5520	E6320	E6420	E6420 ATG	E6520	M4600	M6600	E5430 / E5530	E6230/E6330	E6430/E6430s	E6430 ATG	E6530
Dell Touchpad / Pointing Stick	x	x	x	x	x	x	x																							
Dell Multi-Touch Touchpad											x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x
Dell Jog Shuttle Touchpad										x																				
Dell Jog Shuttle Touchpad (Multi-Touch)																		x												

- Dell Touchpad drivers are different between the 1st and 2nd generation of systems. Drivers from the 1st generation (Dell Touchpad / Pointing Stick) and 2nd generation (Dell Multi-Touch Touchpad) are NOT compatible. Dell strongly recommends only installing the appropriate driver for the system. 3rd generation Latitude Touchpad driver is backword compatible on 2nd generation Latitude systems
- Dell Touchpad drivers are found under the "Input Device Drivers" section posted on Dell's driver & downloads support web site (support.dell.com)

2.6.16 Free Fall Sensor

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the Free Fall Sensor driver. Install the following driver provided by Dell:
    1. Free Fall Sensor driver found under the "Applications" section posted on Dell's driver & downloads support web site (support.dell.com)

2.6.17 Modem (Only applies to some systems)

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the Conexant modem driver. Install the following driver provided by Dell:
    1. Conexant D330,HDA,MDC,v.92,modem available on Dell's driver & downloads support web site (support.dell.com) under the "Communication" section

- If Dell Control Point Connection Manager module is installed, the Conexant modem driver does not need to be installed

2.6.18 Intel vPro or AMT (*Applicable ONLY to vPro Configurations*)

- Intel Active Management Technology (Intel AMT) allows users to easily manage networked computers to:
    1. Discover computing assets on a network
    2. Remotely repair systems even after operating system failures
    3. Protect networks from incoming threats while easily keeping software up to date

- Ensure that the following drivers provided by Dell are being installed prior to installing the AMT drivers:
    1. Intel Mobile Chipset driver
    2. Intel 825xx Gigabit Platform LAN Network Device
    3. Intel Wireless WLAN driver for WLAN AMT manageability via Intel WLAN adapter

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the AMT drivers. The AMT drivers are available on Dell's driver & downloads support web site (support.dell.com) under the "Chipset" section
    1. For E-Family 1st generation systems
        - Intel AMT HECI
        - Intel AMT SOL/ LMS

    2. For E-Family 2nd generation systems
        - Intel AMT HECI (Unified AMT6 Driver)

    3. For E-Family 3rd generation systems,
        - Intel Unified AMT 7 Management Interface Driver

- Intel Identity Protection Technology (IPT) feature requires IPT Middleware to be installed after the AMT Unified driver

4. For E-Family 4th generation systems,
   - Intel Unified AMT 8 Management Interface Driver
   - Intel Identity Protection Technology (IPT) feature was included in Intel Unified AMT8 Management Interface Driver already.

2.6.19 USB 3.0

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the USB 3.0 driver. Install the USB 3.0 driver available on Dell's driver & downloads support web site (support.dell.com) under the "Chipset" section

2.6.20 Touch Screen Digitizer

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the digitizer driver and application. Install the appropriate Touchscreen driver and application available on Dell's driver & downloads support web site (support.dell.com) under the "Input Device Drivers" section

Solution	1st Generation	2nd Generation		3rd Generation					4th Generation
	E6400 ATG	E6410 ATG	M6500	E6420	E6420 ATG	E6520	M4600	M6600	E6430 ATG
Digitech Touch Screen	x	x							
eGalax EMPIA				x	x	x	x		x
n-Trig Multi Touch							x	x	

2.6.21 Webcam -*applies to 1st generation Latitude E-Family & Mobile Precision only*)

- The Dell E-Family Webcam driver enables the built-in system digital camera. Install the following driver provided by Dell for Microsoft Windows XP 32 & 64 Bit only:
  1. Creative Labs Integrated Webcam driver available on Dell's driver & downloads support web site (support.dell.com) under the "Input Device Drivers" section

  2. For video capturing / streaming features, install webcam software available from a variety of third party providers and as freeware

2.6.22 Windows Update

- Dell recommends performing Microsoft Windows updates to ensure the latest security, reliability, and compatibility updates are installed. These updates can be downloaded from Windowsupdate.Microsoft.com

2.6.23 Latitude ON / Precision ON - *applies to 1st generation Latitude E-Family & Mobile Precision only*)

- Microsoft XP 32 & 64-Bit, Vista 32 & 64-Bit, and Win7 32 & 64-Bit Operating Systems do not include the Latitude ON / Precision ON driver and application

- The following table lists which products supports the Latitude ON / Precision ON feature

		1st Generation										2nd Generation							
	Solution	E4200	E4300	E5400	E5500	E6400	E6400 ATG	E6500	M2400	M4400	M6400	E6410	E6410 ATG	E6510	M4500	E4310	E5410	E5510	M6500
Latitude ON	Latitude ON Reader	X	X									X	X	X		X			
	Latitude ON Flash	X	X									X	X	X		X			
	Latitude ON	X	X													X			
Precision ON	Precision ON Reader														X				X
	Precision ON Flash														X				X

- In order to enable the Latitude ON / Precision ON button to hibernate Windows when switching to Latitude ON / Precision ON modes, Dell recommends installing the appropriate software. In order to determine the appropriate software to install, boot to the system BIOS and check the following:
  1. Under BIOS settings -> system configuration
     - Latitude ON – ARM module is installed:
       - Install the "Control Point Button Service" in Windows available on Dell's driver & downloads support web site (support.dell.com) under the "Control Point" section

         NOTE: If you installed the Dell Control Point Connection Manager, the "Control Point Button Service" is already installed

     - Latitude ON Flash / Precision ON Flash – Flash module is installed
       - Install the "Latitude ON Flash" in Windows available on Dell's driver & downloads support web site (support.dell.com) under the "Applications" section

- Latitude ON Reader / Precision ON Reader
  - Install the "Reader 2.0" in Windows available on Dell's driver & downloads support web site (support.dell.com) under the "Applications" section

2.6.24 Intel® Responsiveness Technologies

- Intel® Responsiveness Technology include below three components
  - Intel® Smart Response Technology
    1. Smart response is a driver-based feature that emulates a hybrid drive using a traditional hard disk drive (HDD) and a small solid state drive (SSD). It stores frequently used files, data, and applications to a special partition on a small SSD device. It provides SSD-like read/write performance for the files used most frequently, while providing lower overall storage cost when used with the larger-sized traditional HDD.
    2. Install the Dell IMSM / IRST driver and application available on Dell's driver & downloads support web site (support.dell.com) under the "SATA Drivers" section

  - Intel® Rapid Start Technology
    1. Rapid Start is a BIOS-based feature that replaces Windows® hibernate with a new low-power state; it can improve resume time vs. hibernate by ~2x.
    2. Install the "Rapid Start technology manager" in Windows available on Dell's driver & downloads support web site (support.dell.com) under the "Applications" section.

  - Intel® Smart Connect Technology
    1. Smart Connect is a BIOS- and driver-based technology that periodically wakes the system from the Windows® sleep state to refresh email or social networking applications. When the system is equipped with specific wireless devices, it can detect the presence of known networks while asleep, waking only when connectivity is available. When properly equipped with specific wireless devices, Smart Connect can also provide quick internet connection readiness, by keeping wireless devices active in a low-power mode during sleep.
    2. Install the " Intel® Smart Connect Configuration Application and Driver package " in Windows available on Dell's driver & downloads support web site (support.dell.com) under the "Applications" section.

Table of Storage configurations supported:

Boot Disk (below)/ Technology (right)	**Smart Connect**	**Rapid Start**	**Smart Response**
HDD only	Not supported	Not supported	Not supported

HDD + SSD	Not supported	Supported	Supported
HDD + mSATA	Not supported	Supported	Supported
SSD only	Supported	Supported	Not supported (Note: SSD performance achieved without Smart Response)
mSATA only	Supported	Supported	Not supported (Note: SSD performance achieved without Smart Response)
Hybrid Drive	Not supported	Not supported	Not supported (Note: Hybrid Drive is similar in performance to Smart Response)

Note: Supported for Windows7 only

Note: Please refer to *Intel Responsiveness Technologies Guide* for detail settings of these features.

Appendix

Appendix A

.NET Framework Requirements

What is .NET Framework?

The .NET Framework is a software framework from Microsoft, which is bundled with Windows operating systems. The .NET Framework is intended to be used by most applications created for the Microsoft Windows platform.

.NET Framework Requirements?

Driver / SW Stack		Windows 7	Windows Vista	Windows XP
		.NET 3.5	.NET 3.0	.NET 1.1
Intel	Intel GMA 4500MHD Graphics Intel GMA HD Graphics Intel Media Adapter HD/HD 2000/HD 3000	.NET 3.0	.NET 3.0	.NET 3.0
AMD Catalyst Control Center - Control Panel		N/A	.NET 3.5x	N/A
Intel MSM / RST Storage		.NET 3.0	.NET 3.0	.NET 3.0

Appendix B

512e / 4KBe HDD Re-image Guidelines

1 What is Advanced Format HDD?

HDD industry is moving towards supporting higher drives capacity, to address the current limitations with the 512-byte sector HDDs, the industry is moving towards the Advanced Format with 4KB sector HDDs.

The transition to 4KB sector HDDs will allow storage devices to more easily adopt larger capacities in both the notebook and desktop space.

While hard drives will transition to 4KB sectors and to maintain backwards compatibility, current Advanced Format 4KB HDDs, also known as 512e HDDs, will emulate 512-byte SATA communications to hosts and will operate at 4KB.

2 How does an Advanced Format HDD impact OS Images?

Even though a 512e drive is designed to be backward compatible, most of current Operating Systems are not aware of the Advanced Format technology. Depending on the Operating System and its service pack, some extra steps may be required to optimize the performance of the Advanced Format (512e) HDDs and to maintain full Operating System and Application functionality.

These extra steps could require using alignment tools to fix any sector misalignment as a result of deploying a non-Advanced Format aware image on an Advanced Format HDD which may otherwise cause performance issues.

3 Re-imaging Requirements when using Advanced Format HDDs

The following are the re-imaging guidelines needed to support Advanced Format HDDs. These requirements are dependent on which Operating System will be installed and which method of deployment will be used.

3.1 Microsoft Operating Systems Advanced Format Aware Readiness

An Operating System is Advanced Format Aware if it meets the following criteria:

- It understands the concept of physical sector vs. logical sector
- It maximizes writes using multiples of 4k bytes
- Disk partition starts at the boundary of 4k sector

Not all current Microsoft Operating Systems are Advanced Format Aware (refer to the Table below). A system configured with an Advanced Format drive and an operating system that is not Advanced Format aware can experience sector misalignment, resulting in performance or compatibility issues.

- Some extra steps may be required for re-imaging even with Advanced Format Aware Microsoft Operating Systems, Install/upgrade to the latest Intel Storage driver
- Apply the applicable Microsoft KB article
- Partition alignment

such as (Please refer to section 3.2 for detailed instructions):

Operating System	Advanced Format Aware
Microsoft Windows 7 SP1	Yes
Microsoft Windows 7	Yes
Microsoft Vista SP1	Yes
Microsoft Vista	No
Microsoft XP (all versions)	No
Microsoft Windows PE 3.0 or Later	Yes
Microsoft Windows PE older versions	No

3.2 Image Installation Guidelines

3.2.1 Clean Image Installation on an Advanced Format HDD

<table>
<tr><th>Microsoft® OS Installation Method</th><th>Windows 7 SP1</th><th>Windows 7</th><th>Windows Vista SP1</th><th>Windows Vista</th><th>Windows XP</th></tr>
<tr><td>Using Dell Operating System Media</td><td>1. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td><td>1. Apply Microsoft KB article 982018
2. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td><td>1. Apply Microsoft KB article 2470478
2. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td><td colspan="2">1. Use Alignment Tool [2] to ensure Advanced Format drive partitions are properly aligned
2. Install/Upgrade Intel RST Storage driver to 9.6 or higher[1]</td></tr>
<tr><td>Using non-Dell off the shelf Operating System Media</td><td>1. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td><td>1. Apply Microsoft KB article 982018
2. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td><td>1. Apply Microsoft KB article 2470478
2. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td><td colspan="2">1. Use Alignment Tool [2] to ensure Advanced Format drive partitions are properly aligned
2. Install/Upgrade Intel RST Storage driver to 9.6 or higher[1]</td></tr>
<tr><td>Using Windows PE 3.0 or prior
Note: If using a Win PE version earlier than 3.0, apply Windows Automated KIT</td><td>1. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td><td>1. Apply Microsoft KB article 982018
2. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td><td>1. Apply Microsoft KB article 2470478
2. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td><td colspan="2">1. Install/Upgrade Intel RST Storage driver to 9.6 or higher[1]</td></tr>
<tr><td>Using Windows PE 3.1</td><td colspan="5">1. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td></tr>
</table>

- (1) The Intel RST Driver 9.6 or higher can be found on the Dell Support website in Dell Drivers and Downloads for your system under the SATA drivers section
- (2) Please refer to the Partition Alignment Tools - Section 3.4

3.2.2 Deploying 512B pre-installed image to an Advanced Format drive

<table>
<tr><th>Microsoft® OS Installation Method</th><th>Windows 7 SP1</th><th>Windows 7</th><th>Windows Vista SP1</th><th>Windows Vista</th><th>Windows XP</th></tr>
<tr><td>Using Dell Factory Installed Image</td><td colspan="3">No actions required. Dell Factory Images include required components.</td><td>Not Available</td><td>Not Available</td></tr>
<tr><td>Using Sector-Based Utilities
(Norton Ghost, Altiris, etc.)</td><td>1. Use Alignment Tool[2] to ensure Advanced Format drive partitions are properly aligned before re-imaging
2. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td><td>1. Use Alignment Tool[2] to ensure Advanced Format drive partitions are properly aligned before re-imaging
2. Apply Microsoft KB article 982018
3. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td><td>1. Use Alignment Tool[2] to ensure Advanced Format drive partitions are properly aligned before re-imaging
2. Apply Microsoft KB article 2470478
3. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td><td colspan="2">1. Use Alignment Tool[2] to ensure Advanced Format drive partitions are properly aligned before re-imaging
2. Install/Upgrade Intel RST Storage driver to 9.6 or later[1]</td></tr>
</table>

- (1) The Intel RST Driver 9.6 or higher can be found on the Dell Support website in Dell Drivers and Downloads for your system under the SATA drivers section
- (2) Please refer to the Partition Alignment Tools - Section 3.4

3.3 Other Partition Alignment Requirements

Environment	Action
IRRT / RAID 0,1 & 5 Configuration	Use Alignment Tools[(1)] to ensure Advanced Format drive partitions are properly aligned
Data Protection / Encryption	Use Alignment Tools[(1)] to ensure Advanced Format drive partitions are properly aligned before encrypting the drive. ***Note***: *Misaligned encrypted Advanced Format drives need to be decrypted, then aligned and re-encrypted*

- (1) Please refer to the Partition Alignment Tools - Section 3.4

3.4 Partition Alignment Options

Partition alignment is required for older operating systems and is recommended for new operating systems in order to insure proper hard drive performance and imaging between drives of differing sector sizes. An aligned partition is when the starting offset of the partition is divisible by 4096 Bytes or by 8 for logical block addressing (LBA) numbers.

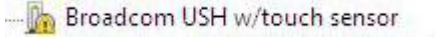
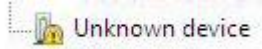
3.4.1Pre-Installation of Operating System

This section lists a few options for partition alignment pre-installation of OS:

- **Using Ghost:**

  Ghost 11.5 will maintain the alignment state of the Gold/Master image. If the disk image is built and aligned on a 512e/Advanced Format drive, the clones of that image will remain aligned. If the image is built on a 512B, Ghost command line switch {-align=1MB} can be used to ensure alignment when deployed to any drive.

- **Using DISKPART:**

DISKPART may be used to enable storage configuration or create a partition at an explicit disk offset from a script, a remote session, or another command prompt.

Dell recommends using WinPE's (3.0 or greater) Diskpart.exe from Windows Vista or Windows 7 to create the partitions for Windows XP installation. This will create a partition that is Advanced Format aligned. Without PE, starting with Windows Vista or Windows 7 DVD to create the partition for the Windows XP will create correct partitioning. On how to use DISKPART utility and how to divide the offset value of the selected partition, refer to Microsoft KB Article 300415

3.4.2 Post-Installation of Operating System

The Paragon Alignment Tool (PAT) is a hardware agnostic tool available for download from the Dell Support website in Dell Drivers and Downloads for your system under the *SATA Drives* section. This tool can be used after an Operating System is installed to align the partitions of an Advanced Format drive.

Appendix C

General Re-Imaging FAQs

1. How do I resolve a PCI Yellow Bang?
    a. After installing the drivers and you have this PCI yellow bang in device manager, you need to install the following drivers found in the Chipset folder:
    PCI Serial Port
    PCI Simple Communications Controller
    b. For E-Family 1st generation you need to install two drivers - AMT SOL / LMS and AMT HECI
    c. For E-Family 2nd generation you need to install one driver - AMT HECI

2. How do I resolve a Broadcom USH Yellow Bang?
    a. After installing the drivers and you have this USH yellow bang in device manager, you need to install the Control Point Security Device Driver Pack
    Broadcom USH w/touch sensor

3. How do I resolve this Unknown Device yellow bang on E-Family 2nd generation?
    a. After installing the drivers and you have an unknown device yellow bang in device manager, you need to install the ST Micro Freefall Sensor driver found under Chipset

4. What drivers are in the Control Point Security Device Driver pack?
    a. The driver pack has the drivers for all security related hardware, including:
        1. Broadcom Trusted Platform Module
        2. Atmel Trusted Platform Module
        3. STMicroelectronics Trusted Platform Module
        4. Winbond Trusted Platform Module
        5. O2Micro Smart Card Reader
        6. Dell Smart Card Keyboard
        7. UPEK TouchChip Fingerprint Reader
        8. Authentec Fingerprint Reader
        9. Broadcom Unified Security Hub
        10. Vista Storage Driver Update (for ATAPI.SYS)

5. Can I use WiMax and WiFi at the same time?
    a. No, the wireless adapter only supports one of them being active at one time

6. What is the Dell System Software utility and why do I need it?

a. The Dell System Software utility provides critical updates and patches for your operating system necessary for the correct operation of your system. It is important to install this utility first after re-imaging your system. It is found under the System Utilities folder on the Dell Drivers and Download page

7. What is the Client System Update application?
   a. Located under System Management > Client System Update, this is primarily targeted at Customers who want to manage systems on their own. The tool is designed to allow users to specify their update preferences and apply updates based on the criticality. Alternatively, end users can use the scheduling option to keep their system up-to-date with the systems software released by Dell

8. What is eSATA?

   One of the connectors on the system is a dual eSATA / USB combo port. It can interface with either an eSATA device or a USB device. eSATA is an industry standard interface. A few of the key benefits of eSATA technology are:

   - Data speeds up to six times faster than USB 2.0 and IEEE 1394
   - Robust and user friendly external connection
   - High performance, cost effective expansion storage
   - Up to 2 meter shielded cables and connectors

Appendix D

Tables

- Control Point System Manager Features - Table B1

Category	Feature	DCP SM Release Version	Availablity of Feature when DCP Installed?	Availablity of Feature when Dell provides drivers/middleware, but No DCP	Availabilty of Feature when only Windows OS installed?
Power Manager	user profiles	v1.0	Yes	N/A	Only power schemes are available in the OS.
	View battery manufacturer info.	v1.0	Yes	N/A	Yes, through BIOS
	View battery health info.	v1.0	Yes	N/A	Yes, through BIOS
	battery charge enable/disable status	v1.0	Yes	N/A	Yes
	Network card power management	v1.0	Yes	Yes (Intel LOM)	No (some Broadcom LOMs)
	Extended Battery Life/ All Day Battery Life. (ADBL)	v1.0	Yes	N/A	No
	Dell Enhanced Performance Plans (User Selectable Thermal Tables for Performance, temperature and sound levels)	v1.4	Yes	N/A	No
	Digidesign Audio/Video mode	v1.3	Yes	N/A	Yes, thru individual settings in BIOS/OS
Display settings	Inactivate display and system timeouts when activating an external display using FnF8.	v1.0	Yes	N/A	No
Function Keys	Fn+F2 to enable Battery Charge disable	v1.0	Yes	N/A	Yes, but with No screen pop-up display
	Fn+F3 launch DCP w/ Battery Status	v1.0	Yes	N/A	No
	Fn+F7 to enable/disable DCP	v1.0	Yes	N/A	No
	Fn+F8 to switch between display settings	v1.0	Yes	N/A	Yes, but with No screen pop-up display
Hot Key customizaton	User hot key customization ability (also Fn+D functionality which is set to toggle display by default).	v1.0	Yes	N/A	No
Keyboard backlighting	Keyboard backlighting options (to be able to set the intensity, inactivity timeout values and input triggers.)	v1.0	Yes	N/A	Yes, but with No screen pop-up display
Brightness	Ability to Adjust Brightness Level	v1.0	Yes	N/A	Yes, but with No screen pop-up display
	feedback through on screen display	v1.0	Yes	N/A	No
	Ability to enale/disable ALS	v1.0	Yes	N/A	Yes
ALS	Feedback through on screen display	v1.0	Yes	N/A	No
Hardware Monitoring for Desktops	Reporting of Ambient Temp log information at OS presence (PWS only)	v1.2	Yes	N/A	Through BIOS
	Reporting of CPU Temp log information at OS presence (PWS only)	v1.2	Yes	N/A	Through BIOS
	Reporting of SMART Alerts log information at OS presence (PWS only)	v1.2	Yes	N/A	Through BIOS
	Reporting of ECC Alerts log information at OS presence (PWS only)	v1.2	Yes	N/A	Through BIOS
Privacy Screen - Discreet Graphics	Fn+E to enable/disable Privacy screen	v1.0	Yes	N/A	No
Privacy Screen - UMA Graphics	Fn+E to enable/disable Privacy screen	v1.2.01	Yes	N/A	No
"Color Space" Panel Settings for RGB LED Displays (17" only)	Provides system level controls for NTSC, sRGB, Pro Photo RGB/Kodak or Adobe color settings (certain panels only)	v1.3	Yes	N/A	No

- Control Point Security Manager Features – Table B2

Category	Feature	Release Version	Availablity of Feature when DCP Installed?	Availablity of Feature when Dell provides drivers/middleware, but No DCP App?	Availabilty of Feature when only Windows OS installed?
ControlVault	Secure processing and storage of user security information	v1.0	Yes - USH platforms only	No	No
	Ability to locally backup and restore credentials in CV	v1.4	Yes - USH platforms only	No	No
TPM	TPM enablement and management	v1.0	Yes	Yes - with third party software, including Windows Vista Bitlocker	No for XP Yes, with Windows Vista (driver included) or third party software, including Windows Vista Bitlocker
Pre-Boot Authentication (PBA)	Password and SSO	v1.0	Yes	Password only, no SSO	Password only, no SSO
Embedded Finger Print Reader	Full configuration and management for PBA and Windows Logon	v1.0	Yes	Yes - with 3rd party software, does not include PBA	No
External Dell Branded Finger Print Reader	Full configuration and management for Windows Logon	v1.0	yes (No PBA SUPPORT)	Yes - with 3rd party software, does not include PBA	No
	Full configuration and management for PBA	v1.4	yes (E2 with CV only, no M'09, Foose, Reebok, or Fonseca support)	No	No
Contact Smart Card Reader	Full configuration and management for Windows Logon	v1.0	Yes	Yes - with 3rd party software, does not include PBA	No
	Full configuration and management for PBA	v1.0	Yes	No	No
Contacless Smart Card Reader	Full configuration and management for Windows Logon	v1.0	Yes	Yes - with 3rd party software, does not include PBA	No
Contacless Smart Card Reader	Full configuration and management for PBA	v1.2	Yes	No	No
Full Disked Encrypted Drives (FDE)	Support for 5400 and 7200 FDE's	v1.0	Yes	Yes - with 3rd party software	Yes - with 3rd party software
	Support for SSD FDE's	v1.2.01	Yes	Yes - with 3rd party software	Yes - with 3rd party software
	Support for dual FDE's (non-RAID)	v1.3	Yes	Yes - with 3rd party software	Yes - with 3rd party software
RSA SecurID	RSA SecurID storage in ControlVault	v1.1	Yes - USH platforms only	Yes - USH platforms only	No
Bitlocker (Vista Only)	DCP does not interact with Bitlocker	v1.0	Yes	N/A	Yes

- Dell Data Protection | Access, DDPA – Table B3

Category	Feature	Release Version	Availablity of Feature when DDPA Installed?	Availablity of Feature when Dell provides drivers/middleware, but No DDPA App?	Availabilty of Feature when only Windows OS installed?
ControlVault	Secure processing and storage of user security information	v2.0	Yes - USH platforms only	No	No
	Ability to locally backup and restore credentials in CV	v2.0	Yes - USH platforms only	No	No
TPM	TPM enablement and management	v2.0	Yes	Yes - with third party software, including Windows Vista Bitlocker	No for XP Yes, with Windows Vista (driver included) or third party software, including Windows Vista Bitlocker
Pre-Boot Authentication (PBA)	Password and SSO	v2.0	Yes	Password only, no SSO	Password only, no SSO
Embedded Finger Print Reader	Full configuration and management for PBA and Windows Logon	v2.0	Yes	Yes - with 3rd party software, does not include PBA	No
External Dell Branded Finger Print Reader	Full configuration and management for Windows Logon	v2.0	yes (No PBA SUPPORT)	Yes - with 3rd party software, does not include PBA	No
	Full configuration and management for PBA	v2.0	yes (E2 with CV only, no M'09, Foose, Reebok, or Fonseca support)	No	No
Contact Smart Card Reader	Full configuration and management for Windows Logon	v2.0	Yes	Yes - with 3rd party software, does not include PBA	No
	Full configuration and management for PBA	v2.0	Yes	No	No
Contacless Smart Card Reader	Full configuration and management for Windows Logon	v2.0	Yes	Yes - with 3rd party software, does not include PBA	No
Contacless Smart Card Reader	Full configuration and management for PBA	v2.0	Yes	No	No
Full Disked Encrypted Drives (FDE)	Support for 5400 and 7200 FDE's	v2.0	Yes	Yes - with 3rd party software	Yes - with 3rd party software
	Support for SSD FDE's	v2.0	Yes	Yes - with 3rd party software	Yes - with 3rd party software
	Support for dual FDE's (non-RAID)	v2.0	Yes	Yes - with 3rd party software	Yes - with 3rd party software
RSA SecurID	RSA SecurID storage in ControlVault	v2.0	Yes - USH platforms only	Yes - USH platforms only	No
Bitlocker (Vista Only)	DCP does not interact with Bitlocker	v2.0	Yes	N/A	Yes

- Control Point Connection Manager Features – Table B4

Category	Feature	Release Version	Availablity of Feature when DCP Installed?	Availablity of Feature when Dell provides drivers/middleware, but No DCP App?	Availabilty of Feature when only Windows OS installed?
WLAN	Dell Wireless LAN 1397, 1510 (Broadcom)	v1.1	Yes	Yes, WITH Dell Wireless Client Utility (DCU)	No for XP Yes for Vista & Win 7, with WLAN AutoConfig, but in box driver has not been Dell validated
	Dell Wireless LAN 1520 (Broadcom TGV - no enterprise extension)	v1.3.01	Yes	Yes, with Dell Wireless Client Utility (DCU)	No for XP Yes - for Vista & Win 7 (with in box drivers) and WLAN AutoConfig
	Intel Wireless LAN 5100, 5300	v1.2	Yes	Yes, with Intel Proset	No for XP Yes for Vista & Win 7, with WLAN AutoConfig, but in box driver has not been Dell validated
	• Intel® Centrino® Ultimate-N 6300 WiFi card • Intel® Centrino® Advanced-N 6200 WiFi card	v1.4	Yes	Yes, with Intel Proset	No for XP Yes for Vista & Win 7, with WLAN AutoConfig, but in box driver has not been Dell validated
	Disconnect on Ethernet WLAN	v1.2	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	No
	View availabe networks & Site Monitors	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	WZC/WLAN AutoConfig for available networks
	WiFi - Catcher	v1.0	Yes	Basic Mode Only	Basic Mode Only
	Hardware Radio Switch	v1.0	Yes	Yes, in BIOS	Yes, in BIOS
	Enterprise Extension for WLAN - 802.1x, WPA-Enterprise/WPA2-Enterprise, CCKM ***(CCX5, TTLS not available for Win 7)***	v1.2	Yes	Yes, wth Intel PROSet or Dell Wireless Client Utility (DCU)	Yes, except CCX and TTLS
WWAN	Dell Wireless Mobile Broadband 5720 Minicard	v1.0	Yes	Yes, with Dell Mobile Broadband Client Utility (DMBCU) for 5720 EVDO (novatel)	No
	Dell Wireless 5600 EV/HSPA (GOBI)	v1.2	Yes	No	No
	Dell Wireless 5530 HSPA Minicard (Helmsley)	v1.0	Yes	No	No
	Dell Wirless 5620 EV/HSPA (GOBI2)	v1.4	Yes	Yes, planned alternative connection manager	No
	Dell Wireless 5540 HSPA Minicard (H2)	v1.4	Yes	Yes, planned alternative connection manager	No
	GPS Novatel/Ericcson	v1.0	Yes	Yes, with Dell Mobile Broadband Client Utility (DMBCU) for 5720 EVDO (novatel) No, for 5530 HSPA (Ericson)	No
	Disconnect on Ethernet WWAN	v1.0	Yes	No	No
	SMS Text Messaging	v1.0	Yes	Yes, with Dell Mobile Broadband Client Utility (DMBCU) for 5720 EVDO (novatel) No, for 5530 HSPA (Ericson)	No
LAN/ Modem/other connections	Broadcom Gigabit LAN	v1.0	Yes	Yes	Yes
	Intel 825X Gigabit	v1.0	Yes	Yes	Yes
	Conexant HAD D330 MDC V.92 modem	v1.0	Yes	Yes	Yes
Location Profiles	Location Profiles	v1.0	Yes	N/A	Yes, limited attributes through Vista and Windows 7 (Network and Sharing Center)
	Import/Export Profiles	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes, limited to WiFi profiles (netsh)
	Profile Management Wizard	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	No
Radio Management	Airplane Mode	v1.0	Yes	No	No
connection/device/status Information	Connection Logs	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	No
	Connection Status	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes
	Device Status	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes
	Network Status Details	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes
	Status Logs	v1.0	Yes	Yes, with Intel Proset or Dell Wireless	No
	Diagnostics Connection base/ Hardware based	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes
	Troubleshooting FAQ's/Web links	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes
Log-on Features	SSO Pre-logon (Windows XP only)	v1.0	Yes	Yes, with Intel Proset or Dell Wireless Clinet Utility (DCU)	Yes, through GPO (Server 2008)
	VPN Enforcement	v1.0	Yes	Yes, with Dell Mobile Broadband Client Utility 9DMBCU) for 5720 EVDO (novatel) No, for 5530 HSPA (Ericson)	No

Appendix E

E-Docks

- **Dell E-Docks (E-Family Docking Stations)**
  - Dell E-Family docking stations are architected differently than previous generations of Dell docking stations.
  - To enhance Plug And Play performance E-Family products no longer require a docking profile

    Note: USB devices might be malfunction after docking/undocking. It's a known issue on Windows XP. Please refer to http://support.microsoft.com/kb/871233 to get workaround.

  - The following are the list of features and expected behavior differences between D-Docks and E-Docks:

Features & Expected Behavior Differences - D-Docks Vs E-Docks

		Latitude D/Dock	Latitude D/Port	Latitude E-Port Plus	Latitude E-Port	Latitude E-Legacy Extender	Notes
Video Ports	VGA	X	X	X	X		
	S-Video	X	X				
	Composite Video						
	DVI	X	X	2	X		
	Display Port			2	X		
Legacy Ports	Serial	X	X	X		X	
	Parallel	X	X	X		X	
	PS/2	2	2	2		2	
Ports	USB	3	3	6	6	2	
	Powered USB	X	X				
	Powered eSATA			X	X		
	ExpressCard Slot						
	Media Card Reader						
	RJ-45	X	X	X	X		
	RJ-11	X	X				
	Audio	X	X	X	X		
	Mic	X	X	X	X		
	S/PDIF	X	X				
	Lock	X	X	X	X		
Power Supply	Internal AC Power	130W					
	External AC Adapter		90W	130W	130W		
Others	Modular Bay	X					
	PCI Slot	X					
	Monitor Stand Port			X	X		
	160GB HDD						
	Network USB						
	Dimension (HxDxW)	2.76x6.3x12.28	2.09x5.59x10.87	2.1x6.69x11.3	2.1x6.69x7.87		
Docking and Undocking Behavior	HW Docking Profiles	X	X				
	Hot Docking (uninformed)	X	X	X	X	X	
	Hot Undocking (informed)	X	X				Press the "Undock Request" button on the dock, or select the "Undock" option from the Windows Start Menu
	Hot Undocking (uninformed)			X	X	X	Simply press the "Eject" button on the dock
	Warm Docking (uninformed)	X	X	X	X	X	
	Warm Undocking (informed)	X	X				Press the "Undock Request" button on the dock, or select the "Undock" option from the Windows Start Menu
	Warm Undocking (uninformed)			X	X	X	Simply press the "Eject" button on the dock
Networking Behavior when Docked	LOM (RJ45) cable attached	Enabled	Enabled	Enabled	Enabled	NA	
	LOM (RJ45) no cable	Disabled	Disabled	Disabled	Disabled	NA	
	Wireless (WiFi)	Enabled	Enabled	Enabled	Enabled	Enabled	Can use DCPCM, Dell Wireless Client Utility, or Intel ProSet Utility to disable Wireless when system detects a LOM connection.
	WWAN	Enabled	Enabled	Enabled	Enabled	Enabled	Can use DCPCM to disable Mobile Broadband card when system detects a LOM connection.
	WPAN (Bluetooth)	Enabled	Enabled	Enabled	Enabled	Enabled	
Storage	eSATA attached HDD	NA	NA	See note	See note	NA	Sata configuration modes: 1. IRRT or AHCI mode: When docked, the connected eSATA HDD will be enumerated. 2 ATA mode: When docked, the connected eSATA HDD will not be enumerated. To enumerate the user needs to restart the system.
Dual-Display Video Persistence Supported when Docked	LCD plus VGA	X	X	X	X		Video Persistence is defined as the preservation of the dual display settings when the system is docked.
	LCD plus S-Video	X	X				
	LCD plus DVI	X	X	X	X		
	LCD plus Display Port			X	X		
	VGA plus S-Video	X	X				
	VGA plus DVI	X	X	X	X		
	VGA plus VGA	NA	NA	NA	NA		
	DVI plus S-Video	X	X				
	DVI plus DVI			X			
	Display Port plus Display Port			X			
	Display Port plus DVI			X	X		
	Display Port plus VGA			X	X		

Notes:

The term "uninformed" means the user does not have to inform the system ahead of time of an action.
The term "informed" means the user has to inform the system ahead of time of an action (ie. Pressing the "Undock Request" button on a D-Family dock before undock
The term "hot docking" means the act of docking the system when the system is fully on.
The term "hot undocking" means the act of undocking the system when the system is fully on.
The term "warm docking" means the act of docking the system when the system is in Stand by.
The term "warm undocking" means the act of undocking the system when the system is in Stand by.